Climate Physicians and Surgeons

Author(s): James Rodger Fleming

Source: *Environmental History*, April 2014, Vol. 19, No. 2 (April 2014), pp. 338-345

Published by: Oxford University Press on behalf of Forest History Society and American Society for Environmental History

Stable URL: https://www.jstor.org/stable/24690567

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James Rodger Fleming

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Abstract

Medical metaphors involving Earth and its atmosphere have a very long history. Both ancients and moderns anchored their environmental thinking in analogies of bodily growth and decay, health and disease. This tradition found its way into dynamic meteorological analysis in the first two decades of the twentieth century. Now dynamic climatology is appropriating this medicalized language, with some practitioners referring to themselves as climate "physicians and surgeons." This essay examines the historical dimensions of the metaphor that the earth, especially its atmosphere, is coming under "managed care" by atmospheric scientists and is being prepped for invasive techniques administered by barber surgeons posing as climate engineers. It provides an example of how environmental historians can use their knowledge of the past to analyze language involving the "control" of nature and contribute effectively to current public policy debates.

INTRODUCTION

In recent years, leading figures in the climate modeling community have called themselves "planetary physicians" and have appropriated descriptive metaphors from medical practice. The earth is out of balance, running a "fever" of one degree compared to a century ago, and the prognosis is not good. The fever will likely worsen substantially in the century to come, leading to melting ice caps, rising sea levels, killer heat waves, and stronger hurricanes. Humans, by adding to the greenhouse effect, are morally culpable through overconsumption and addiction to fossil fuels. The "planetary physicians" recommend drastic lifestyle changes such as a strict carbon "diet" to stabilize the amount of carbon dioxide (CO_2) in our atmosphere and other

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mitigation strategies such as renewable energy sources and energy efficiency to avoid the most dangerous climatic consequences. Compliance with this advice, however, will involve the entire population of Earth and will likely necessitate complete restructuring of policies and even polities worldwide. Others, on the fringe, advise an invasive form of planetary surgery called geoengineering.[1]

Undoubtedly, our use of language is saturated in metaphor, some of which, as in Darwin's distinction between natural and artificial selection, had clear explanatory power.[2] Modern climate physicians and surgeons, however, often conjure with metaphors unreflexively and with little to no regard for either history or the limitations of their language. Firmly grounded in the physical sciences, most have no training in medicine or for that matter in social sciences or humanities—Mark Carey's essay in this Forum notes how climate modelers often incorporate human history and societal factors into their models even though they have no formal training in social theory. Yet many freely don the mantle of planetary philosopher or even savior. Such rhetorical lacunae can provide fruitful points of entry for environmental historians to contribute to interdisciplinary climate discussions.

THE TRADITION

An ancient tradition of medical topography links weather, climate, and health from the perspective of the patient, not the planet. The Hippocratic tradition viewed health as an expression of the balanced interplay between persons and their surroundings, emphasizing the importance for health and disease of water, place, topography, and orientation to sun and wind.[3] An eighteenth-century revival of this tradition by John Arbuthnot, William Falconer, and others popularized the notion that conditions in the atmosphere—especially seasonal changes and rapid changes of temperature—were related to the recurrence and spread of disease.[4] The bodily humors got out of balance, but not the earth as a whole.

Climate change in this era literally meant changing *climes*—the result of long ocean voyages and resettlement. Dr. John Lining, who arrived in Charleston, South Carolina, about 1730, found the climatic conditions radically different from those of his native Scotland. In 1740 he decided to observe both the weather and the intake and output of his own body for a period of one year in an effort to understand their relation to epidemic disease: "I began these experiments . . . [to] discover the influence of our different seasons upon the human body by which I might arrive at some certain knowledge of the cause of our epidemic diseases which regularly return at their stated seasons as a good clock strikes twelve when the sun is on the meridian."[5] In a related effort, Dr. Edward Holyoke, a promoter of medical education in Massachusetts, provided a monthly tabulation of meteorological data, observations

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on the prevailing diseases, vital data on the number of persons dying, and the "causes" of the 139 deaths in Salem in 1786.[6] Leading medical institutions such as the College of Physicians in Philadelphia also joined the cause. Its charter, written in 1787, forged an explicit link between recording meteorological observations, investigating diseases and epidemics, and advising the government on medical matters.[7] As the eighteenth century came to a close, ideas regarding medical geography were epitomized by Noah Webster's two-volume review of the relationships between "pestilential epidemics and sundry other phenomena of the physical world." Webster included weather conditions, comets, volcanic eruptions, earthquakes, and meteors as epidemiological factors.[8] Organized groups of physicians also served as observers of weather and climate. During the War of 1812, US army surgeon general James Tilton, motivated by prevailing environmental theories of disease that linked illness and epidemics to weather and climate, issued a general order directing all physicians under his command to "keep a diary of the weather" and prepare quarterly reports as part of their official duties.[9] For the next six decades, the army Medical Department continued its support for meteorology by observing, recording, and analyzing airs, waters, and places for the protection of the health of the troops. Weather and climate history, it seems, is firmly based on medical foundations, but its practitioners never claimed to be planetary physicians or surgeons.

There are other precedents too. On regional and national scales, the anti-desiccationist physicians and foresters involved in island and forest management and their eventual transformation into forest, water, wildlife, and soil conservation services represent direct manifestation of an interventionist therapeutic discourse.[10]

CURRENT PRACTICE

A revival in environmental medicine is now underway. Some twenty-first-century physicians are hesitantly exploring climate change as a possible etiological explanation for allergies and other seasonal conditions. The more vociferous are going much further, insisting that climate change *kills,* and that climate-induced changing geographic patterns of disease involving the likes of cholera, malaria, dengue fever, and Lyme disease threaten epidemics that require our urgent, concentrated, and coordinated responses.[11] The emerging theory of biocomplexity links an upward spiral of influences from bacteria and viruses to larger and larger levels of life through the cell, the organism, the community, the ecosystem, and ultimately, the climate system.[12]

Early physicians focused on the effects of good airs and bad on the well-being of individuals while paying some attention to regional epidemics. Most aimed to "do no harm." Yet modern medicine, rooted in the traditions of the iatrochemists and barber surgeons, emphasizes

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radical interventions via pharmaceuticals, chemotherapies, and surgery. Today's medical researchers speculate about systematic connections between health and the global environment. Some climate scientists, playing doctor, are expressing concern about the "health" of the planet as a whole. Richard Somerville of Scripps Institution of Oceanography claimed in an editorial, "We climate scientists are planetary physicians," and while climate science is admittedly incomplete, it is still "good enough to provide advice well worth following."[13] The patient is Earth, and the doctor recommends swearing off carbon (a mixed metaphor equivalent to quitting smoking, giving up alcohol, or adhering to a strict diet). Somerville later shifts his voice to that of a "planetary public health" official encouraging humankind to muster the wisdom and the will to make such difficult changes. He concedes that "our planetary well-being is ultimately in the hands of the patient," but the "patient" has no hands—or literally, 14 billion of them!—with no one having the authority to sign a medical release form.

A colorful cartoon in *Nature* depicts suffering Earth with a fever induced byCO_2 being tended by three planetary physicians in charge of the Intergovernmental Panel on Climate Change (IPCC). As Bert Bolin (Sweden) records vital signs on a clipboard, John Houghton (United Kingdom) applies a comforting touch to the planet's brow, and Luiz Gylvan Meira Filho (Brazil) gestures toward a thermometer inserted into "Earth's mouth" somewhere near Madagascar in the Indian Ocean.[14] Assuming the daylight side of the planet is illustrated, there is another thermometer insertion point near La Jolla, California, where the sun is not shining.

Figure 1: Medicalization of global warming. Bert Bolin, John Houghton, and Luiz Gylvan Meira Filhov are caricatured. Credit: John Houghton, "Meetings That Changed the World: Madrid 1995: Diagnosing Climate Change," *Nature* 455 (2008). Reproduced by permission of Macmillan Publishers Ltd.

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The ill-planet metaphor is the organizing principle of the book *Climate Change: Picturing the Science* by Gavin Schmidt and Joshua Wolfe. Major sections carry the labels "Symptoms" (taking the temperature of the planet), "Diagnosis" (the prognosis for the climate), and "Possible Cures" (preventive planetary care).[15] The authors employ these chapter headings uncritically as loose medical metaphors but do not follow up with analysis in the text. In the destructive wake of 2012 Hurricane/Superstorm Sandy, noted rhetorician George Lakoff has coined a new metaphor in an attempt to link severe weather events with global climate warming: "systemic causation." He writes, "Smoking is a systemic cause of lung cancer. HIV is a systemic cause of AIDS. Working in coalmines is a systemic cause of black lung disease. . . . Global warming systemically caused the huge and ferocious Hurricane Sandy."[16] Others have called such rhetorical excess a form of "tabloid climatology."[17]

Climate change discourse is not, and perhaps never was, "owned" by the diverse and far-flung climatological science community, yet the field was built, over the *longue durée,* on concerted attempts to apprehend climate change, stake out authoritative positions, and forge climate "consensuses" from antiquity to the IPCC. Throughout history, understanding of climate change has been built on layer after layer of authority, prestige, data, experiments, theory, modeling, technology, and ultimately, consensus. It has also been built on metaphors.

Atmospheric scientists, however, have lost control—that is, whatever sense of control they had gained—of the grand narrative of scientific interdisciplinary and technological progress central to their field.[18] In recent years, new voices from the press, the public, the state, and the environmental movement have flooded the literature, adding polarizing voices, while venerable but vulnerable practices of peer review and journal publication have taken backseats to the new electronically facilitated "peer-to-peer" review and ubiquitous blogs, tweets, and quacks. A division of climate labor has not produced a unified product—instead it has generated interdisciplinary status anxiety in which most mainstream atmospheric scientists are wary of the excessive control claims of would-be climate engineers. Such is the power of metaphor gone awry.[19]

What about planetary surgery? An emerging breed of so-called geoengineers thinks that Earth will heat up destructively in the near future, that voluntary compliance with emissions reductions is highly unlikely, and that invasive techniques to cool the planet will be necessary. Shoot sulfates or reflective nanoparticles into the upper atmosphere, turning the blue sky milky white. Make the clouds thicker and brighter. Fertilize the oceans to stimulate massive algae blooms that turn the blue seas soupy green. Suck CO_2 out of the air with hundreds of thousands of giant artificial trees. Has "managed care" failed? Is Earth, the patient,

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now being prepped for invasive procedures? Is there a planetary anesthesiologist available?

James Lovelock, celebrated originator of the "Gaia hypothesis" (itself a metaphor), refers to himself as a "geophysiologist," or planetary physician. He has diagnosed Earth as having a fever induced by the parasite *Disseminated primatemia* (the superabundance of humans). As treatment, he recommends a low-carbon diet combined with nuclear medicine (nuclear power), but does not advocate population reduction or geoengineering, which he likens to crude planetary surgery, as practiced by the butcher/barber surgeons of old. "Our ignorance of the Earth system is overwhelming. . . . Planetary scale engineering might be able to combat global warming, but as with nineteenth-century medicine, the best option may simply be kind words and letting Nature take its course."[20] These sentiments are misleading, since Lovelock and Chris Rapley have recently proposed their own version of a geoengineering fix for the "pathology of global warming," specifically, a vast array of vertical pipes placed in the oceans to bring colder nutrient-rich water to the surface to spur the growth of CO_2-absorbing plankton. But many worry that the idea might interfere with fishing, disrupt whale populations, and release more CO_2 into the atmosphere than it captures.[21] Today's would-be geoengineers insist that theirs is an unprecedented practice. Yet if they hope to make a positive contribution to looming environmental challenges, they need to study the checkered history of their enterprise, rooted, in many cases, to highly questionable practices from the Cold War era.[22]

Rhetoricians Brigitte Nerlich and Rusi Jaspal have examined a number of metaphors involving geoengineering.[23] They trace the "planet as body" metaphor back to (who else?) Edward Teller, who called for a planetary sunscreen in 1997.[24] They link this to the "planet as patient" metaphor, with Earth being not just out of balance, but a critically ill patient who needs invasive surgery, a medical/technological fix that the geoengineers promise to provide.

CONCLUSIONS

Metaphors provide a vehicle for historians to examine assumptions involving the "control" of nature, contribute to current public policy debates, and avoid presentism while doing so.[25] When communicating to the public, climatologists often use and misuse medical metaphors without carefully considering their limitations and power to mislead. The "death of Lake Erie" in 1970 is a powerful metaphor familiar to all environmental historians. But "planet as body/ planet as patient" metaphors have a much larger reach; they imply the mortality of Earth, itself an ancient trope. If, as rhetorician Suzanne Romaine has argued, "it matters which metaphors we choose to live by," so too, if we choose unwisely or fail to understand their implications, "we will die by them."[26]

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By participating unreflectively in metaphorical language that medicalizes climate change, we enable what Mike Hulme has called a new "climate reductionism," driven by the hegemony of the natural sciences over more nuanced and historically informed accounts of social life and visions of the future.[27]

James Rodger Fleming *is a professor of science, technology, and society at Colby College and a visiting scholar at Columbia University in New York City. He has written extensively on the history of weather and climate.*

Notes

1 For details, see James Rodger Fleming, *Fixing the Sky: The Checkered History of Weather and Climate Control* (New York: Columbia University Press, 2010).

2 George Lakoff and Mark Johnson, *Metaphors We Live By* (Chicago: University of Chicago Press, 1980).

3 Hippocrates, "On Airs, Waters, and Places," *Hippocratic Writings,* trans. Francis Adams (Chicago: Encyclopedia Britannica, 1952), 9–19. See also "Of the Epidemics," in ibid., 44–49, and Frederick Sargent II, *Hippocratic Heritage: A History of Ideas about Weather and Human Health* (New York: Pergamon, 1982), 49–59.

4 John Arbuthnot, *An Essay Concerning the Effects of Air on Human Bodies* (London, 1731); and William Falconer, *Remarks on the Influence of Climate, Situation, Nature of Country, Population, Nature of Food, and Way of Life, on the Disposition and Temper, Manners and Behavior, Intellects, Laws and Customs, Form of Government, and Religion, of Mankind* (London, 1781).

5 John Lining to Secretary of the Royal Society, January 22, 1741, *Philosophical Transactions of the Royal Society* 42 (1742–43): 491–509; (1744–45): 318–30.

6 Edward A. Holyoke, "Observations on Weather and Diseases at Salem, Massachusetts, for the Year 1786, Extracted from a Communication by Edward Augustus Holyoke, M.D. to the Massachusetts Medical Society," in *An Historical Account of the Climates and Diseases of the United States of America,* comp. William Currie (Philadelphia, 1792), 13–28.

7 *The Charter, Constitution and Bye Laws of the College of Physicians of Philadelphia* (1790), 3, quoted in Brooke Hindle, *The Pursuit of Science in Revolutionary America, 1735–1789* (Chapel Hill: University of North Carolina Press, 1956), 296.

8 Noah Webster, *A Brief History of Epidemic and Pestilential Diseases with the Principal Phenomena of the Physical World, Which Precede and Accompany Them, and Observations Deduced from the Facts Stated,* 2 vols. (Hartford, 1799).

9 US Army Medical Department, "Regulations for the Medical Department," in *Military Laws and Rules and Regulations for the Army of the United States* (Washington, DC, 1814), 227–28.

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com/cs24bv5; Paul Epstein and Dan Ferber, *Changing Planet, Changing Health* (Berkeley: University of California Press, 2011).

12 Rita Colwell, "Emerging and Re-emerging Infectious Diseases: Biocomplexity as an Interdisciplinary Paradigm," *Ecohealth* 2 (2005): 244–57.

13 Richard Somerville, "Medical Metaphors for Climate Issues: An Editorial Essay," *Climatic Change* 76 (2006): 1–6.

14 *Nature* 455 (October 9, 2008).

15 Gavin Schmidt and Joshua Wolfe, *Climate Change: Picturing the Science* (New York: W.W. Norton, 2009).

16 George Lakoff, "Hurricane Sandy: Global Warming, Pure and Simple," Salon.com (October 31, 2012). http://tinyurl.com/cmz2ynl.

17 Warren Pearce, "Short Circuiting the Language of Sandy— How to Balance Literalism and Lucidity," *Making Science Public* (November 14, 2012). http://tinyurl.com/cktpat6.

18 James Rodger Fleming, *Convergence: Atmospheric Science, Technology, and Society, 1900 to 1960* (forthcoming).

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22 James Rodger Fleming, "Will Geo-Engineering Bring Security and Peace? What Does History Tell Us?" Geoengineering: An Issue for Peace and Security Studies. *Sicherheit und Frieden/Security and Peace* 4 (2012). http://www.sicherheit-und-frieden.nomos.de/1/current-issue-and-archive/2012/issue-4/.

23 Brigitte Nerlich and Rusi Jaspal, "Metaphors We Die By? Geoengineering, Metaphors, and the Argument from Catastrophe," *Metaphor and Symbol* 27 (2012): 131–47.

24 Edward Teller, "The Planet Needs a Sunscreen," *Wall Street Journal,* October 17, 1997, A22.

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26 Suzanne Romaine, "War and Peace in the Global Greenhouse: Metaphors We Die By," *Metaphor and Symbolic Activity* 11 (1996): 175–94.

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